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Newmarch, William

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THE
PROGRESS OF ECONOMIC SCIENCE

DURING THE

LAST THIRTY YEARS;

AN OPENING ADDRESS

BY

WILLIAM NEWMARCH, F.R.S.,

*As PRESIDENT of the SECTION (F), of ECONOMIC SCIENCE
and STATISTICS, at the THIRTY-FIRST Annual Meeting of the
BRITISH ASSOCIATION for the ADVANCEMENT of SCIENCE, held
at MANCHESTER, 4th—11th September, 1861;*

WITH A REPORT OF THE CLOSING PROCEEDINGS OF
THE SECTION.

(From the Notes of the Shorthand Writer.)

The Officers of Section F were as follows: but for the opinions and statements contained in the Opening Address, the President is of course alone responsible.

Section F.—ECONOMIC SCIENCE AND STATISTICS. (*Assembly Room, Free Trade Hall, Manchester.*)

President.—William Newmarch, F.R.S.

Vice-Presidents.—Edwin Chadwick, C.B.; Wm. Farr, M.D., F.R.S., D.C.L.; James Heywood, F.R.S.; W. N. Massey, M.P.; Lord Monteagle; Right Hon. Joseph Napier; Alderman Neild; Daniel Noble, M.D.; Rev. Canon Richson, M.A.; Colonel Sykes, M.P., F.R.S.; William Tite, M.P., F.R.S.

Secretaries.—Rev. J. E. T. Rogers, M.A., Tooke Professor; Edmund Macrory, M.A.; L. C. Christie, M.A.; David Chadwick, F.S.S., Assoc. Inst., C.E.

Committee.—Henry Ashworth; James Aspland, M.D.; Thomas Bazley, M.P.; Samuel Brown, F.I.A.; C. H. Bracebridge; John Cheetham; William Camps, M.D.; J. Franklyn; Henry Fawcett, M.A.; Richard Foot; Robertson Gladstone; S. Gregon, M.P.; The Lord Provost of Glasgow; James T. Hammack; Frederick W. Haddon; Right Hon. T. E. Headlam, M.P.; Edward Herford; Edwin Hill; William Langton, F.S.A.; Rev. A. Hume, D.C.L.; The Mayor of Manchester; James McConnel; James McClelland; Rev. W. N. Molesworth, M.A.; Alfred Neild; Captain Palin; Edmund Potter, F.R.S., President of the Manchester Chamber of Commerce; Arthur Moore, F.S.S.; Frederick Purdy; H. D. Pochin, F.C.S.; Malcolm Ross, Vice-President of the Manchester Chamber of Commerce; John Shuttleworth; R. J. Spiers; Right Hon. Lord Stanley, M.P.; John Strang, LL.D.; W. M. Tarrt; John Watts, Ph.D.; William Westgarth; Robt. Wilkinson, L.C.P.; Thomas Wilson, M.A.; Cor. Van der Maeren.

The President (in Chief) of the Meeting of the Association, at Manchester, was Willam Fairbairn, F.R.S.

The Progress of Economic Science during the last Thirty Years:—an OPENING ADDRESS by WILLIAM NEWMARCH, F.R.S., as PRESIDENT of the Section (F) of ECONOMIC SCIENCE and STATISTICS, at the Thirty-First Annual Meeting of the BRITISH ASSOCIATION for the ADVANCEMENT of SCIENCE, at MANCHESTER, 4th—11th September, 1861;—with a REPORT of the CLOSING PROCEEDINGS of the Section.

[From the Notes of the Shorthand Writer.]

THERE is some danger at this time that undue importance may be attached to the achievements of Physical Discovery. Surrounded as we are by the great results which have been accomplished by Railways, Ocean Steamers, Telegraphs, Tubular Bridges, and Rifled Cannon, there is some danger, and it is not a small danger, that we may attach excessive and undue importance to the obligations which society owes to those discoveries—great and momentous beyond all question—and to the achievements which have followed them. I venture, however, to think that if we consider carefully the history of the last Thirty Years, we shall find that during that time there have been in operation certain powerful Economical and Social forces, the effects of which have been hardly less striking or beneficial than the effects which have flowed from the physical discoveries I have mentioned.

We shall find first of all that during the last thirty years, by the application of sound economic doctrines to subjects of Foreign and Inland Trade, a change has been produced so extensive that it affects not merely the population of our own country, but affects in a marked and beneficial manner the populations of most of the countries which form the commercial world. We shall find, further, that during the same period, by the application of sound principles to the subject of Taxation, we have succeeded in removing from amongst ourselves sources of danger and discontent which threatened the most lamentable consequences. We have also, during the same time, by the aid of larger views and more exact knowledge, succeeded in rearing up a long list of Colonies in the Eastern and Western Hemispheres on principles so sound, that they have borne the test of rough experience, and have now become landmarks in our legislation. By the application of larger and more accurate rules of judgment to the subject of Education, we have succeeded in adding depth and breadth to the foundations of those habits of morality and order which in truth constitute the real superiority of the inhabitants of this country over the people of other parts

of the world. We have in the fifth place, by the application of a similar careful and sound philosophy to questions relating to the Sanitary Condition of the country, already produced effects which it is impossible to contemplate without surprise and gratitude. By the application of Sanitary Science to the improvement of our dwellings, and to the cleansing of our towns, we have been able to accomplish a marked reduction in the annual rate of mortality; and we have done not a little to promote the further supremacy of our own race by largely improving and strengthening its physical type. Nor have we been less successful in discovering and applying effectual means for the prevention of Crime and for the establishment of reformatory agencies designed to render the occurrence of crime less frequent. In truth, so great has been the success which has attended this part of the labours of the last thirty years, that we are in some measure justified in hoping that a time may not be very distant when we shall be relieved almost entirely from the affliction and peril of what have been called "the dangerous classes." In the last place, we are entitled to say, that our success has not been small in dealing, since 1830, with the extensive and intricate subject of the Poor Laws. Those who remember what was the social condition of this country thirty years ago—before any systematic attempts had been made to settle the Poor Laws upon sound principles—will set due value upon the advance which has been made during that time; and will not fail to be thankful for the sound and satisfactory basis upon which this important part of our social legislation now rests.

Looking back at the changes and the experience of which this is a rapid outline, it appears to me that I shall not be in any danger of misleading the Section if I suggest, that probably the most conspicuous and important fact to be found in the history of Economic Science during the last thirty years is this;—namely, that while there has been no change in the objects to which it is directed—no change in the purposes intended to be worked out—while these objects and these purposes remain the same in their broad and general aspect, as they have been from the time of Adam Smith—there has been a marked change in the Methods according to which Economic Science is cultivated. It has ceased to be an abstract science,—it has ceased to be a system of subtle and ingenious reasonings. It has little by little, and by a process cautious and full of promise, become a science almost entirely experimental. We have learned that in all questions relating to human society,—in all controversies where the agency of human beings has to be relied upon for working out even the smallest results—we have learned that in these inquiries the only sound basis on which we can found doctrines, and still more the only safe basis on which we can erect laws, is not hypotheticala

deduction, however ingenious and subtle, but conclusions and reasoning supported by the largest and most careful investigation of facts. This vital change of method, this substitution of observation and experiment (and for our present purpose the two words mean very much the same thing) for deductions arrived at by geometrical reasoning, seems to me to be the most prominent fact of the last thirty or forty years, as regards the progress of the branches of knowledge which more immediately interest us in this Section.

We are surrounded by evidence of the occurrence of changes closely analogous in almost every other division of human inquiry. A strong desire for evidence ample and accurate, an ardent craving after the results of the most patient investigation of large actual experience, and increasing distrust of doctrines and conclusions which do not rest upon such experience, are habits and tendencies of mind which have become prevalent not only among those who cultivate Economic Science, but among the cultivators of knowledge of nearly all kinds. We find this experimental and scrupulous spirit vigorously manifest in the pursuits of the Historian. We have seen it carried to a large, and frequently, perhaps, to an excessive extent in Archaeology, and in the descriptions of art, and the kinds of knowledge which rest upon ancient precedents. We find it busily at work in Literature; incessantly digging up startling facts with which to pull down old and build up new reputations. We find it also happily in Politics, and there at least where the only lawful object is wise legislation, a regard for actual experience rather than a proneness to loose speculation must be almost an unmixed good. It appears to me, therefore, looking at the changes of the last thirty or forty years, that we are fully justified in accepting as one of the most conspicuous and fortunate of the results arising out of those changes, the introduction into the large class of inquiries which relate to the constitution and control of human societies, of an observing, cautious, and experimental spirit,—a spirit which leads men to accept no doctrine and place reliance on no conclusion which come to them supported only by hypothetical reasoning, however subtle and ingenious;—but on the contrary strongly disposes them to consider the teachings of Experience, if not as the exclusive, certainly as the chief foundation for leading opinions and practical measures.

It has been often said—formerly perhaps more frequently than at present—that some degree of reproach attaches to Economic Science, inasmuch as it is not purely a Science, but partakes largely of the nature of an Art. I confess that this criticism seems to me to be scarcely a reproach at all. It seems to me also to proceed upon a hasty and imperfect view of the real difference between science and art—and especially of the science and art embraced in Political

Economy. Science, according to the generally accepted definition, is simply a collection of rules and laws, and of statements of general results. The end of all Science is knowledge, simply and purely. It does not concern itself with precepts. It does not concern itself with applications and utilities. It confines itself to a specific declaration that such and such is the order of nature, and thence its teachings come to an end. In the case of astronomy, for example—to select one of the most familiar instances—the functions of the astronomer, as a purely scientific man, are at an end when he has declared that the solar system and the planetary bodies exist and move in a certain order. It is no part of the functions of the astronomer, purely as such, to give precepts and advice as regards the practical application of the knowledge at his command. It is no part of his scientific functions, for example, to recommend that the results of his observations shall be reduced into the practical form of a Nautical Almanac and sold at a cheap rate for the safety of mariners and the benefit of calendar makers. Physiology, in like manner, gives no precepts. It limits itself, as a science to the announcement that certain results, good or bad, flow from certain conditions; and it leaves to others the application of these discoveries to some useful end. Physiology, as a science, has no exhortations to urge as regards the establishment of hospitals, the provision of fire-escapes, or the proceedings of the sanitary officer. This is the state of the case if we consider human knowledge solely from the scientific level—that is, solely as a collection of results collected together because they are true, and not because they are useful or agreeable, or the contrary. But it seems to me, that in surveying human knowledge from this purely scientific level we are confusing ourselves with an unreal distinction, and misapprehending the intimate relation which exists between discovery and precept. The truth really is, that all sciences are more or less necessarily arts; that the connection between the scientific law and the precept founded upon it is so close and immediate that it requires no small effort of attention to satisfy one's self that it is possible to have a scientific law without a practical precept inseparably attached to it. Take, for example, one of the cases to which I have already referred. The astronomer finds, by means of his observations, that at a certain future time there will be combinations of heavenly bodies of such a nature that the occurrence will afford great assistance to navigation. Surely, the first impulse of a reasonable human being, under such circumstances, would be to convert the discovery into a precept, and to take the most effective measures for deriving as much benefit as possible from the scientific fact. In like manner, the discoveries of Physiology, and improvements in the treatment of the sick, in the management of hospitals, and the cleansing of towns, are all essen-

tially parts of the same train of thought, and consequences of the same antecedent.

But in the case of Economic Science the connection between the science and the art is still more emphatic and intimate than in any of the Physical Sciences. I have just said that not even the smallest problem in Economic Science can be worked out except by the agency, in some form, of human beings. From first to last the whole subject matter of this branch of knowledge is Man in Society, and the regulations which will best promote the happiness and comfort of men living in societies. The connection, therefore, in this case, between the science and the art—between the law discovered and the precept and practice founded on that law,—is so near and intimate that only confusion and error can ensue from unwise attempts to separate them.

There is another difficulty to contend with in connection with this subject, and that is the difficulty of finding sufficiently comprehensive, but also sufficiently precise expressions by which to describe or designate the range of topics which concern us in this Section. Economic Science is a technical term, applicable in strictness only to those inquiries which relate to the production, accumulation, and distribution of Wealth. But if we stop there—if we concern ourselves only in investigating the single subject of wealth—we shall but imperfectly acquaint ourselves with the leading influences which (apart from physical causes) determine the advancement and comfort of human communities. "Social Science" is a term which has been much used of late years, and although it is certainly not the happiest of descriptive phrases, nor a term which satisfies many of the desirable conditions, still it is probable that the time has come when by general consent we must attach to the words "Social Science" a definite technical meaning, and understand them to imply a range of topics considerably larger than is included in the scope of Economic Science, but still excluding a great number of subjects which the phrase "Social," if used in its ordinary meaning, would assuredly imply. If, for example, a person were carefully to set out all the influences which (physical causes apart) affect men in societies—that is all the social influences—it does not require much reflection to perceive that he would have placed before him a field of inquiry so vast that it would be presumptuous in the highest degree to attempt to grapple with it, and futile in the highest degree to attempt to define and describe it by any single phrase. In the first place, the foundation of any system of social order and administration must be sought in Morality and Religion; and commencing with these we should find that rightly to apprehend social stability and progress we must extend our inquiries in some such order as the following, namely:—Political Economy, Jurisprudence, Municipal

Law, Education, Sanitary Science,—closing probably with the Fine Arts and the art of Government. This is a field of inquiry manifestly so wide and diversified that it would be idle to affect to regard it as one subject, or to apply to it any single phrase of precision. We must clearly be content with a conventional and circumscribed view of what we agree for convenience to call Social Science. There is a kindred association, which is establishing itself rapidly in the public estimation, I mean the National Association for the Promotion of Social Science—an association which I may safely say took its origin in this very Section, for when it was found after long experience that the topics which came before us here were so manifold and extensive that we could not hope to deal with them satisfactorily, it occurred to some leading and active minds that it was desirable to form a separate association which should wholly occupy itself, according to a scheme of proceeding resembling that of the British Association, with questions of Social Science. Starting with the experience acquired at former meetings of this Section, and aided in no slight degree by the public opinion which those meetings had fostered and promoted, a large and powerful association has been rapidly established, and has already, in spite of opposition and ridicule in some quarters, secured for itself no mean place in the public favour. Looking at the proceedings of this important body, the probability seems to be, that by-and-by we shall come to understand by a sort of general agreement, that on grounds, at least of convenience, if not of strict etymology or exact definition, "Social Science" shall be understood to include the five kindred inquiries of Political Economy, Jurisprudence and Amendment of the Law, Education, Sanitary Science, and Statistics. These are five lines of inquiry, which all converge to the same point; and although many independent divergences occur in the course which they pursue towards that point, still the ultimate results are so completely the offspring of evidence and conclusions drawn from each of the five divisions, that it seems to be probable that before long we shall find it convenient to regard these five groups of topics as in reality branches of the same subject; and so completely branches of the same subject that we shall hesitate to accept doctrine which are not supported by reasonings and evidence which imply familiarity not with one group only of the five, but familiarity more or less extensive with the whole.

I have included Statistics as one of these five groups. Now I am bound to tell you, that Statistics taken alone cannot properly be described as a science. I am bound to tell you, that in Statistics we have no such body of general laws as are to be found in other branches of inquiry, which no one hesitates to describe as sciences.

We have, for example, in Statistics no such body of general laws as are to be found in dynamics, as are to be found in chemistry, or in physiology. But then we claim for Statistics—and it is no small claim to put forward for any branch of knowledge—that it is the application of the Experimental or Baconian method to the several divisions of inquiry which relate to man in society. We say, that where there is no careful application of the Statistical method—in other words, where there is an absence of observation and experiment, so far as observation and experiment can be applied to men in societies—there can be but faint hope of arriving at the truth in any line of research connected with social problems. But we go further. We say, that we have already made sufficient advances in the application of Statistics during the last thirty, and more especially during the last ten or fifteen years, to be able to affirm that we begin to see our way to the establishment in several directions of what may be conveniently called Ultimate Statistical Units. We have, in truth, made no trifling advances towards the construction of an Economical and Statistical Chart, the results of which will be hardly inferior in exactness, as they assuredly will not be inferior in interest or importance, to the admirable charts already constructed of the geology or geography of leading States.

Let me tell you of a few of the principal subjects upon which we are arriving at ultimate statistical units. First, there are Vital Statistics—then Commercial Statistics—then Economical Statistics—fourthly, Trade Statistics—and lastly, Taxation Statistics. What do we mean by an Ultimate Unit in Vital Statistics? We mean, that by a careful series of observations extended over sufficient periods of time and applied to classes of people sufficiently different in their occupations and modes of life, we have been able to arrive at a result which expresses, with a high degree of accuracy, the annual death-rate which ought to prevail in a community which avails itself diligently of the appliances for preserving health which modern science and civilization have placed at our disposal. In this country, very much by the perseverance and skill of my friend Dr. Farr, who sits on my right, we have found by the application of careful statistical methods, carried on systematically year after year, that in a community of human beings inhabiting a country like our own and enjoying reasonable comfort, the rate of mortality in one year ought not to exceed 17 in the 1,000. In that numerical result, or rather in that Ultimate Statistical Unit, of 17 in the 1,000, as expressing the annual death-rate prevailing in this climate, in a population living under circumstances not specially but ordinarily favourable, we have arrived at a conclusion of a solid and important kind. It is not a conclusion which I will venture to suggest to you may be placed on an equality with the sublime law of definite propor-

tions discovered by your own Dalton; but we may fairly place it in the second rank of scientific results. Taking our stand on this Ultimate Unit of annual mortality, we are able to say that wherever the deaths greatly exceed the ascertained limit there is something amiss; and that an urgent responsibility rests on the inhabitants of a town or district in which an excessive death-rate prevails to lose no time in removing the causes which are inflicting an excessive waste of human life. I say that in this simple formula of 17 in the 1,000 we have one of those Ultimate Statistical Units which places in our hands, as regards the future, a definite kind of force, the value of which we cannot very well over estimate.

The same reasoning and the same inferences apply to the other four classes of Statistical results to which I have referred, but I cannot now detain you by considering them with minuteness. I will say on y, that under the head of Economical Results we are making progress in determining for several countries the figures which in each represent the average earnings of ordinary unskilled labour, and the kind of food, clothing, and shelter which those earnings will purchase. That is to say, that by-and-by we shall be able to describe the Economical condition of different parts of the world as precisely and specifically as we are at present able to describe their geography or their ethnology.

But before I leave this part of the subject, let me make one observation further relative to Vital Statistics—and it is this, that probably no test can be suggested which is so exhaustive as indicating the real character of a civilisation as the rate of *Infant* mortality. We know pretty well what is the rate of infant mortality in a considerable number of our towns and country districts, and we know the corresponding rate in similar districts in other countries, and I am induced to think that in those cases where the infant death-rate is the lowest, there human life is maintained under the most favourable conditions, moral and physical. Consider what is implied by a low rate of infant mortality. It supposes a moral relation of the sexes. It supposes skill, care, and affection on the part of the mother, and effort and vigilance on the part of the father. It supposes wholesome dwellings and appropriate food; and still further, it supposes knowledge and intelligence sufficient to apply all these advantages in the best way. When then by means of statistical researches we show, that in a given place the rate of infant mortality is less than in some other, or than in almost any other, we have conferred upon that particular place a great benefit, for we have shown that there human life goes on in a sober and orderly way, and that men and women have learned adequately to appreciate and understand the prize of existence placed in their charge.

Let me say here, that a meeting was held last year in London

which was full of promise as regards the future advancement of scientific Statistics,—I mean the International Statistical Congress. We had there, representatives of nearly all the Governments of Europe. We had also representatives from some of the countries on the other side of the Atlantic. The efforts and labours of the Congress were directed to the establishment of methods whereby, in the different countries represented, the same processes may be followed in arriving at the same pre-arranged results; and by this and other means we have so cleared the path, that we are justified in expecting that at no distant date we shall have established over a large area of the earth a series of those Ultimate Statistical Units which will exhibit accurately, and free from any devices of rhetoric or arts of description, the real effects of the social arrangements and relations which prevail in different parts of the world.

I have told you, that Statistics cannot claim to be a Science in the precise sense of that term. I must now tell you that so far as Statistics are concerned I do not consider that any numerical results put forward by Statisticians are entitled to be called or regarded as statistical “laws.” We have heard a great deal lately of these so-called “statistical laws.” We have heard a great deal of the Necessarian conclusions which are said to flow inevitably from the evidence of a certain class of statistical results, or “laws.” It appears to me, with all deference, that the term “law,” as applied to any statistical result whatever, is a misapplication of the term. The utmost that Statistics can do is to express numerically the *average* result of any given series of observations of occurrences taking place under particular conditions among human beings. But in the case of a physical law, I would suggest to the Section that our knowledge is so much superior to any expression of mere average, that we can predict the result of any single event or experiment as confidently and accurately as we can predict the results of series of similar events. In the case of astronomy, for example, we can predict as certainly what will be the motion and place of one star on a particular day in a particular part of the heavens as we can predict the motions and places of hundreds of stars. In like manner in all the other natural sciences the power of individual prediction is founded, and founded wholly, not upon an “average” inference, but upon a certain knowledge of the rigid operation of a “law” which holds good as absolutely in single cases as in masses of cases. In dynamics we know perfectly beforehand what will be the result of any given experiment as regards momentum under prescribed conditions, or as regards the movement of prescribed bodies through a specified medium. But in the case of Statistics—that is, in the case of knowledge which does not rise above the level of an “average” inference—we have absolutely no power

whatever of prediction in individual cases, and only a very qualified power of prediction as regards masses of cases. Take, for example, that kind of statistical knowledge which has been carried perhaps to the greatest perfection because large pecuniary interests are dependent upon it—I mean the application of Statistics in estimating the duration of human life. Even there, extensive and systematic as is our knowledge, we have, I need hardly say, no power, as concerns any individual person, or any half-dozen persons, of hazarding an opinion whether they will or will not live for one year or for twenty; and even as applied to numbers of human beings the average duration of life at which we arrive by means of statistical inquiries amounts to no more than a probability, and a probability of a low order compared with the rigid exactness of such primary physical laws as those, for example, of gravitation and definite proportions.

It has been said sometimes, and especially of late years, that certain kinds of Statistics prove that the human will operates *necessarily* within the groove, as it were, of some recurring cycle. I confess it has always seemed to me that the great disturber of all statistical uniformity and averages is precisely the uncertain operation of the human will. Let me again repeat that Statistics, as applied to man in society, are no more than carefully recorded observations of occurrences which take place among a certain number of human beings living under certain conditions. But the actions of human beings are dependent upon ideas and convictions; and alterations in ideas and convictions inevitably change and disturb the nature of the kind of occurrences capable of statistical record. I suppose, for example, that thirty years ago it would have been easy to have constructed a table drawn from materials existing in Jamaica, showing the number of cases of ill-treatment of negroes by their English owners on the average of some term of years; and upon such a table it might have been possible to construct an ingenious Necessarian theory of the operation of the human will in the flogging of black men and women. But a change has taken place in the ideas entertained by the English people of the lawfulness of slavery. These ideas have attained the height of emancipation. Slavery has happily been put an end to, and the kind of statistical evidence I have pointed out has disappeared altogether. The same reasoning may be applied to a variety of other cases.

But as concerns the important class of Statistics which exhibit the average number of Births and Deaths, it is plain that such a record includes mainly physical events; for the number of births and deaths occurring in a given time, in a given population, is obviously determined almost wholly by a class of physical causes—age, food, shelter, comfort—to which I need not refer in detail; and the same observation applies in a larger measure to marriages.

We may be reminded, perhaps, that there are other classes of events recorded and tabulated by statisticians which cannot be referred to physical causes—such as the average number of misdirected letters, lost umbrellas, and other minor casualties—and that these records present us with highly uniform results. I freely grant that many of these results are exceedingly curious; but I wholly demur to the suggestion that they supply any adequate foundation for so vast a doctrine as the Necessarian theory of the operation of the human will, or even for the reality of what are called “Statistical Laws.” I can only admit the validity of the term “law” where there is a power of accurate prediction in individual cases; and we shall scarcely be expected to believe in this power of individual prediction as regards misdirected letters or lost umbrellas.

I have been thus careful to point out to the Section what seem to me to be errors and sources of danger in some recent views of the province of Statistics, not, as you will easily believe, with any design of derogating from the dignity and value of statistical inquiry, but because I desire to be governed, from first to last, by that spirit of truth and candour which must guide all our investigations and discussions at these meetings; and because no good results can follow from the introduction into any department of knowledge of pretensions which are not justified by its scope and conditions.

I have said that the principal fact in the history of Economic Science during the last thirty years, has been the more systematic and extensive application of the Experimental Method throughout the entire range of questions with which the science is concerned. It is right that I should give you some examples of this change. The experimental method has been largely applied in every direction, but if I was asked to point out those directions in which, perhaps, the most marked results have been produced by its application in modifying conclusions which were previously entertained, I should select six subjects, which will be easily recognized as among the most important in the whole range of the branch of knowledge to which they belong. I should point to the application of the test of experience and observation in modifying the doctrines which formerly prevailed:—

First, as regards the conditions which govern the progress of Population in modern civilized communities;—second, as regards the true principles to be followed in founding and managing Colonies;—third, as respects legal interference with Labour in factories and elsewhere;—fourth, as regards the leading doctrines relative to Currency, Banking, and Prices;—fifth, as regards the nature, origin, and operation of Rent;—and sixth, as concerns the effects to be produced by a

large and sudden increase in the quantity of Metallic Money in use in the commercial world.

I have enumerated these six subjects, and if the time and occasion were appropriate it would not be difficult to show that in each of them extensive and fundamental changes have been introduced during the last thirty or forty years by the application of the test of experiment and observation. I am not, of course, going to detain you by a discussion in detail of all six of these subjects. I will refer only to two of them. I will refer to the topics which relate to the Legal Interference with Labour—and those which relate to Currency, Banking, and Prices.

When I advert to the first of these topics—that of the Legal Interference with Labour,—I am aware that I am speaking in a place where the subject is far better understood than perhaps anywhere else; and in an assembly whose practical knowledge of the question far exceeds any knowledge I may possess, founded as that knowledge is upon theoretical inquiries only. Until about thirty or thirty-five years ago there were probably no portions of political economy which seemed to be more free from doubt than the doctrines which it then included as regards absolute non-interference by the State in bargains between masters and workpeople. If there was one economic canon which more than another seemed to all the writers from Adam Smith to Ricardo to be entitled to rigid observance, it was the rule of *laissez faire* in every part of the dealings between employers and employed. It was maintained that in such questions it is the function of the Government to stand altogether aside, and to leave the parties to settle their own differences as may seem to them to be best. And when we look back at the history of our own and other countries—when we remember the incessant and mischievous interference inflicted upon all sorts of occupations by syndics, guilds, and Government officers, from the days of Charlemagne down to our own time—when especially we recall the superlatively vicious legislation of France and Germany in this respect, century after century,—we cannot wonder that the founders of the science with which we are here concerned, were led to express, in the most distinct terms, their adhesion to the doctrine of *laissez faire*, especially in relation to employers and employed. And this doctrine requires but few qualifications so long as it is applied to adult males working singly, or in families, or in small groups, each man being free to make his own independent bargain. But when a new state of things was introduced—when manufactures came to be carried on by large masses of human beings, closely congregated together, and including women and children,—then new conditions were brought into play, and it became necessary to re-investigate the principles which previously

had been accepted as sufficient. This re-investigation led to those new doctrines of the necessity of State Interference, which ultimately carried the Ten Hours Bill. When these new doctrines were first heard of they were naturally met on the part of the capitalists by the objection that to limit the hours of labour would mischievously and fatally discourage capital in its application to manufactures. What was the answer to this objection? The controversy, as you know, extended over many years, and gradually it was proved by experiment and observation that when capital, as in the case of manufactures, depends for profitable results upon the employment of large masses of workpeople, a great proportion of whom must be women and children, it is the direct and plain pecuniary interest of the owner of the capital to take especial care of the physical energy and condition of his workpeople. Our friend Mr. Edwin Chadwick, whom we are glad to see here, will tell us, too, as the result of most elaborate investigations, that even as regards machinery in its most complete development, and involving, therefore, the least aid from manual labour, real efficacy of exertion does not mean unlimited hours of work, but skilled efforts judiciously applied during the best chosen parts of the day. Discussions and evidence, all pointing steadily to such conclusions as these, gradually introduced modifications into the former views of *laissez faire* as being in itself the perfect and sufficient rule for arrangements between masters and workpeople in manufacturing trades. I need not tell a Lancashire audience—speaking after many years experience of the Ten Hours Legislation—that the results are something of which all parties may well be proud. There is, in truth, a general assent that if there has been one change which more than another has strengthened and consolidated the social fabric in this part of the island—has cleared away a mass of depravity and discontent—has placed the manufacturing enterprise of the country on a safe basis—and has conferred upon us resources against the effects of foreign competition which can scarcely be overvalued—it is precisely the changes which have been brought about by the sagacious, and persevering, and successful efforts to establish in manufacturing occupations a sound system of Legal Interference with the hours of labour.

The second class of topics to which I have to advert are those relating to Currency, Banking, and Prices.

There used to be received, with scarcely any dissentients, three principal doctrines relating to a Convertible Paper Currency. It used to be held that fluctuations in the amount of bank notes in the hands of the public operated in some direct manner on prices;—that consequently the convertible paper currency must be properly regulated, so that vicious fluctuations of prices might be prevented;—and thirdly, that what were called appreciation and depreciation of

the currency, and not the operations of supply and demand, and capital and credit, govern the foreign exchanges, produce over-trading, and lead to financial disasters and panics.

But by a persevering and systematic application of the test of observation and experiment, it has been proved, by evidence so extensive and various that we may well claim for it the force of demonstration;—first, that fluctuations in the amount of a paper circulation strictly convertible into coin does not govern prices at all, but that prices are governed by supply and demand, and by operations of capital and credit. Second, that due and rigid enforcement of cash payment is the only wholesome regulation which a paper circulation requires;—and thirdly, that bank notes are no more than the mere small change of the ledger, and that the phenomena which are really worth attention are not infinitesimal fluctuations in the amount of bank notes, but changes in the rate of interest.

I am perfectly aware that these conclusions are still somewhat hotly contested by a large and intelligent party, and by a party in every way entitled to be heard. For myself I shared them with, and I chiefly learnt them from, perhaps the best, and wisest, and most accomplished person it has so far been my fortune to meet—I mean the late Mr. Tooke; and I am quite ready to take my share in defending doctrines which are known by his name.

Before passing to the next part of this discourse, I may here appropriately suggest that there is one result of our more exact knowledge, which may be regarded as a sort of corollary of the review we have just taken of some leading topics—and it is this result,—namely, that while it used to be very commonly said in the early days of Political Economy, and even within the compass of this generation, that though we knew a great deal about the problems which affect the production and accumulation of wealth, we knew very little about its Distribution. We are now beginning to see that if we properly understand the principles which should guide us in promoting the production and accumulation of wealth, we may safely conclude that the process of distribution will take care of itself in a very wholesome and efficacious manner.

I have referred to five classes of results with which Statistical inquiry is mainly concerned. Let me now state in outline, as shortly as I can, the groups of topics which may be considered to constitute the domain of Economic Science. These seem to me six-fold—namely, first, all such problems as relate to the real nature of Wealth, and to the production and growth of wealth in a community;—second, all such as relate to the Exchange of commodities, that is to say to inland and foreign Trade;—third, all problems relating to Taxation and Finance;—fourth, problems relating to Currency,

banks, and prices;—fifth, problems relating to the Wages and the hire of labour, and the division of employments;—and lastly, problems relating to the functions of the State as regards Interference with the economic relations of its subjects.

With respect to the first *three* of these groups of problems, it is probable that no further important doctrines remain to be discovered. There is little further to be found out concerning the real nature of wealth, concerning the true principles of exchange, or concerning taxation and finance, beyond the conclusions already established and expounded.

The fields of inquiry to be still explored and cultivated, are those which lie in the direction of Currency, Employments, and Interference by the State; and if I may express an individual opinion, it would be to the effect that it is probably, as regards the last of these subjects, namely, Interference by the State, that the most remains to be done, and difficulties of the gravest kind remain to be surmounted. We seem to be gradually arriving at the conclusion—and a conclusion founded on no slight evidence—that as society advances, especially in an old country,—as social relations become more complex,—there grows up a class of difficulties which cannot be dealt with satisfactorily by individual exertion, and therefore a class of difficulties which must be dealt with by the State. While on the one hand we are bound to maintain a salutary dread and a constant suspicion of the interference of the State beyond the narrowest limits, so on the other hand we cannot disguise from ourselves that there are a large class of cases in which individual agency wholly fails to protect the plainest individual rights.

The conclusion of the whole matter seems to be, that as the result of the last Thirty Years, full as that period has been of scientific achievements, we may justly claim for the services rendered by Economic Science and Statistical Inquiry, a place in the first rank.

That in the second place we may safely consider that we have now arrived, in these branches of knowledge, at a kind of intermediate point at which, after long debate, many of the earlier controversies are finally settled, and from which we see our way to a higher level.

That thirdly, the least doubtful result of our experience has been the discovery that the most solid progress is made by guiding ourselves in the main by close observation of facts, and by employing speculative and hypothetical reasoning under the most cautious conditions, and always with distrust and reluctance.

And lastly, that the time has perhaps come when we may with advantage bring into close contact, as departments of the same

subject, several of the branches of inquiry which are specially devoted to the study of social phenomena.

But there is a larger moral behind these conclusions. What is it that has made the last thirty years an age of revival and restoration in the largest sense? Is it not that we have come vividly to perceive two things, namely—first, that human life is fitted for higher ends than to be given up to incessant labour and devoted to the pursuit of excessive gain; and second, that for the attainment of these higher ends we must cast aside all false supports and contend with no hollow earnestness for the highest place among modern civilized States. It is no small thing for a community to become convinced, as we have become convinced, that it is possible to work over much—that material wealth, wholesome and reasonable in its right place, may be won at too great a cost—that something real is to be gained by allegiance to Truth for its own sake—and that overflowing comfort and social rank are, after all, not idols of the most worthy type. Nor is there any occasion to affect sentimental grounds for this less material philosophy—for it may be stated as a kind of universal corollary of all economic systems, that no societies so rapidly pass away as those which pursue only material objects. To be efficacious, even for its own end, wealth must be used as an instrument; and to use it rightly there must be intelligence, taste, and imagination, as well as industry, frugality, and skill.

In this country, also, we must be watchful and patient in our search for new truths. We are engaged in a fair and open, but also in a sharp and earnest rivalry with all the world, and the victory must fall to that competitor who, other things being equal, has on his side the most profound and extensive knowledge. There are certain landmarks in all branches of knowledge which no wise man will attempt to disturb, except upon the strongest grounds. Still, subject to these reasonable restraints, it is salutary that the lists should be kept freely open to all comers. If the assailants of received opinions are in error they will fail, and their failure will add new strength to previous conclusions. If they succeed, they will become public benefactors. We are not, however, to be credulous or weak-minded. We are to be reasonably jealous of the cry of new lamps for old—remembering well how often the real meaning of the cry is an audacious invitation to exchange diamonds for dross. But we are also to remember that the most efficacious conservatism of the past is to present an open countenance, and to apply an exploring hand, to the novelties of the present. To deal with them frankly, courteously, and plainly. To welcome them if they be true, and expose them if they be false.

If we pursue this policy we need not trouble ourselves about

the time to come. The world is not put together so unskilfully that it is in danger of falling to pieces when the warfare is directed only against ignorance and its evil brood. We need not speculate on the moralizings of some future Australian islander over the ruins of London. Such a traveller is far more likely to find a palatial city spreading in graceful terraces along both sides of the Thames until Windsor Castle becomes a west end mansion, and suburban villas are scattered over the hills of the White Horse.

No instance can be found of the decay of a community in which the humbler classes, in full possession of personal freedom, and wholly apart from any artificial reliance or support, could each by their own labour earn the means of substantial independence. If for any length of time a community be strong and sagacious enough to solve practically the great problem of combining the largest and most orderly freedom, with ample wages, earned in fair competition with all the world, we may depend upon it that the foundations of such a State are too firmly set to be shaken by any ordinary catastrophe. And it is because in this country we have done not a little during the last thirty years to discover and fashion the corner stones of so noble and solid a fabric, that we are justified in looking towards the future with hope and confidence.

CONCLUDING PROCEEDINGS OF SECTION F.—*Tuesday,*
10th September, 1861.

The following report of the concluding proceedings of the Section on Tuesday, the 10th September, is from the "Times" of the following day:—

The light Hon. J. Napier proposed a vote of thanks to the President for the very efficient manner in which he had discharged his duties in presiding over that important Section. They had sat for a week, and during that time every variety of subject had been brought forward; and they had had the advantage of the skill and masterly ability of the occupant of the Chair. He was one of a class of men who were peculiarly entitled to respect—men who by the self-elevating power of intelligence and vast industry had raised themselves to a distinguished public position, and who stood well with all their well-thinking countrymen. He rejoiced to see him in the chair, his presidency harmonizing so well with the position of the President of the Association (Mr. Fairbairn), who was the honour, and ornament, and praise of the town. He was sure they would all have the greatest pleasure in passing a vote of thanks to his friend, Mr. Newmarch, for the able, efficient, and instructive manner in which he had discharged the duties of President of that Section. (Cheers.)

The Mayor of Manchester said he had much pleasure in seconding the resolution. All of them must have derived satisfaction and profit in attending the Section; and especially in listening to the clear and perspicuous manner in which the President had stated the merits of every question which had come under discussion.

The resolution was carried amid general applause.

The President said, I am very much obliged to you, ladies and gentlemen, for the vote of thanks which you have been good enough to pass for the very humble services performed by me in this chair. I certainly came to Manchester fully prepared to carry out so far as I could any duties which might fall upon me; and I am glad to find that the way in which those duties have been performed has met with your approbation. (Hear, hear.)

I will take the opportunity which is now afforded to say a few words in review of what has taken place in this Section during the week.

I cannot but lament that our time has been insufficient for the task we had set ourselves. We certainly have made some advance upon the arrangements which have prevailed at former meetings of this Section; and I hope that next year, and in future years, we shall succeed more entirely in confining our labours to such questions as belong properly to Economic Science. There is less reason why

questions of a general nature should be obtruded here, since there is a separate association for the advancement of social science, where questions of a general nature may be introduced with more advantage, and discussed with more benefit. But so far as our labours have proceeded, I find that we have got through between forty and fifty papers, which will admit of being somewhat distinctly classified.

In the first place we have had a series of papers, relating to what I may call Lancashire topics. Among these I will give the first place to an excellent paper by Mr. J. Shuttleworth, pointing out to us the working of the Manchester Gas Act; Mr. Chadwick gave us a great deal of valuable information on the progress which has been made by Manchester and Salford during the last twenty years. It was to be expected that a meeting of this kind held in Manchester could scarcely be considered effective unless the question of Cotton was discussed; and we have largely benefited by papers read by Mr. Bazley and Mr. Ashworth; and we had also a short paper from Mr. Alderman Neild, which was highly acceptable, inasmuch as he stated facts of an order which we are not always able to obtain. We had a paper from Dr. Strang on the Embroidery trade of Scotland and Ireland. Also, under the head of Lancashire topics, we had a valuable paper from Dr. J. Watts, on Strikes. We had a series of papers on Co-operative societies, beginning with one by Mr. Potter on the general principles of the question, and followed by two statements from Rochdale, informing us in a very succinct and clear manner of the results of the remarkable experiments going on in that town.

The second group of papers related to questions purely Statistical. First in this list I must refer to a remarkably excellent paper by my friend Professor Rogers—a paper compiled by him during the last few months with so much labour, perseverance, and skill, and containing a collection of Prices in this country in the sixteenth century, the period of the first influx of gold from the New World. I regard that paper as one of the most valuable fruits of the Statistical Congress of last year. I hope it is but the precursor of many more, and that the example which Professor Rogers has set will lead to similar researches being undertaken and carried on not only in this country, but in other parts of the world. (Hear, hear.) Dr. Farr gave us some acceptable information on the health of the British Army—a subject with which he is officially connected, and upon which he is eminently qualified to express an opinion. Then we had a valuable paper from Mr. Purdey on the comparative Pauperism of England, Scotland, and Ireland; and we had also an elaborate paper from Mr. Valpy, stating, in a convenient form, facts relative to the Trade between this country and France. We have to-day had several papers on the late Census, beginning with that of Mr.

Hammack, who comes among us speaking with the authority due to one of the chief officials connected with the operations by which the enumeration of the population has been carried on and completed. We have had also a statement from Dr. Strang of the results of the late Census as regards Scotland. On Saturday we heard from Colonel Sykes, one of the oldest and staunchest friends of this Section, an elaborate paper on the trade of India and China.

The third division consists of questions purely Economical. I confess I should have been glad if we could have had more of those papers, and I again repeat the wish I have already expressed, that in future years and in other places where this association assembles—and I think we may fairly assume that Section F will remain an integral part of the association (hear, hear)—a larger number of papers of a purely economical nature may be read—papers raising, as that of Professor Rogers to-day, purely economical questions, and going straight to some great doctrine, the discussion of which must be attended with good results. Foremost in this group of economical topics is the series of papers on national Taxation. Those papers you all will remember, inasmuch as they were before us only yesterday; but as it fell to my lot to take a leading part in the discussion, I pass them over simply with this reference. As regards special taxation, we had a timely paper from the Rev. Canon Richson, on the Income Tax—a paper which there is reason to hope may lead to ulterior results. (Hear hear.) Under the head of distinctly scientific subjects, we had a second paper from Professor Rogers, "On the Definition and Incidence of Taxation;" and we have heard to-day at address from Mr. Fawcett, "On the Effects of the New Gold Discoveries."

In the fourth place, on general topics we have heard this morning Mr. Heywood on the subject of "Endowed Schools;" Dr. Hume, "On Education in Liverpool;" a short and interesting statement from Captain Donnelly "On the Progress made in the Government Examinations in Science;" and also a paper by Mr. Ashworth, "On Capital Punishments;" while yesterday afternoon we were instructed by hearing Mrs. Fison dilate so charmingly in the midst of us "On Sanitary Reform." Beyond these there were several contributions, in themselves of a minor kind, but well worth listening to, and raising points which I am sorry the Section had not time to discuss as they deserved. The discussions which have taken place have been distinguished, I think, beyond any occasion I can recall in connection with these meetings, by earnestness and courtesy, and by close adherence to the points which it was material to consider. They have been distinguished by these qualities in a happy and prominent manner. So completely has this been the case that I hope I may indulge the belief that scarcely any members of

the British Association who, during the last four or five days, have done this Section the honour of attending it, will carry away any recollections which are not of an agreeable order; that they will look back upon this meeting as an occasion on which they heard many new truths, or as a meeting at which they first learnt to regard important questions from a new point of view. (Cheers.)

Now, ladies and gentlemen, allow me, in conclusion, to say, that for the success which has attended our meeting here, we owe a deep debt of gratitude to every party connected with the city of Manchester. From the Mayor of the city down to the meanest cabman, I believe there is not a single individual throughout this great community who has not felt it to be a special personal obligation to do what lay in his power to promote the success of the meeting. (Cheers.) I, therefore, in your name, and in the name of Section F, tender my best thanks in the first place to the Municipal authorities who are represented on this platform by the worthy Mayor of the city. I thank, in the second place, the Commercial community for the munificent manner in which they have thrown open their establishments, and for the arrangements they have made for our benefit and amusement. I tender our thanks, too, to the private inhabitants, who have exercised so wide a liberality in throwing open their houses for our entertainment and reception; and, in the fourth place, I tender our best thanks to the local Committee and the local Secretaries, who not merely during the last week, but for a great many weeks preceding the opening of the meeting, have been untiring in their exertions to contribute to our comfort during the proceedings. (Hear.) In return for all these favours conferred, we are entitled to believe that the meeting has been productive of no small amount of good, and that the seeds here sown will blossom and fructify luxuriantly in the time to come. I will only add, as regards myself, that if I have in the least degree contributed to that end, I shall be amply repaid for the labour I have undertaken. (Cheers.)

A vote of thanks to the Secretaries was proposed by Mr. Webster and seconded by Dr. Farr.

In responding Professor Rogers said the more they saw of Manchester the more they liked it.

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